Amendments to the Specification:

Please replace paragraph [0005] with the following amended paragraph:

[0005] As application temperatures increase further beyond the thermal capability of a Si-containing material (limited by a melting temperature of about 2560°F (about 1404°C) for silicon), relatively thick coatings capable of withstanding higher thermal gradients are required. However, as coating thicknesses increase, strain energy due to the CTE mismatch between individual coating layers and the substrate increases as well, which can cause debonding and spallation of the coating system. As a solution, U.S. Patent No. 6,444,335 ~~09/543,956~~ to Wang et al. discloses a compositionally-graded T/EBC system that exhibits improved mechanical integrity for high application temperatures. The T/EBC system includes an intermediate layer containing YSZ and mullite, alumina and/or an alkaline-earth metal aluminosilicate (preferably BSAS). The intermediate layer is used in combination with a mullite-containing layer that overlies the surface of a Si-containing substrate, a layer of an alkaline-earth metal aluminosilicate (again, preferably BSAS) between the mullite-containing layer and the intermediate layer, and a thermal-insulating topcoat of YSZ overlying the intermediate layer. An optional silicon bond layer may be deposited on the

substrate prior to depositing the mullite-containing layer. The mullite-containing layer has a CTE above that of a Si-containing substrate but less than that of the YSZ topcoat, and therefore compensates for the difference in CTE between the Si-containing substrate and the other coating layers. In addition, the mullite-containing layer serves as a chemical barrier between BSAS layer and the Si-containing substrate to prevent interaction of BSAS with the silicon oxidation product (SiO_2) at high temperatures. The BSAS layer provides environmental protection to the silicon-containing substrate, while the YSZ topcoat offers thermal protection to the Si-containing substrate and the other underlying layers of the coating system. Finally, the intermediate layer serves as a thermal barrier layer that also provides a CTE transition between the BSAS layer and the YSZ topcoat as a result of its BSAS, mullite and/or alumina content, each of which has a CTE between that of YSZ and Si-containing materials.

Please replace paragraph [0017] with the following amended paragraph:

[0017] Figure 2 is a scanned image of a cross-section of a substrate 10 on which a multilayer T/EBC system 12 has been deposited. The substrate 10 is formed of a SiC/SiC CMC, though the invention is generally applicable to other materials containing silicon in any form. The coating system 12 is

representative of the coating system disclosed in U.S. Patent ~~Application Serial~~ No. 6,444,335 ~~09/543,956~~ to Wang et al., and as such includes a thermal-insulating topcoat 22 that provides environmental protection to the underlying substrate 10 as well as reduces the surface temperature of the substrate 10 and interior layers 14, 16, 18 and 20 of the coating system 12. The preferred material for the topcoat 22 is YSZ, preferably containing about 7 to about 10 weight percent yttria, though it is foreseeable that other ceramic materials could be used. A suitable thickness range for the YSZ topcoat 22 is about 12.5 to about 1250 micrometers (about 0.0005 to about 0.050 inch), with a preferred range of about 125 to about 750 micrometers (about 0.005 to about 0.030 inch), depending on the particular application.

Please replace paragraph [0019] with the following amended paragraph:

[0019] The innermost layer seen directly on the substrate 10 in Figure 2 is an optional silicon layer 14. In accordance with U.S. Patent ~~Application Serial~~ No. 6,299,988 to Wang et al. ~~09/299,418~~, the inclusion of the silicon layer 14 is useful to improve oxidation resistance of the substrate 10, and enhances bonding of the mullite/BSAS layer 16 to the substrate 10 if the substrate 10 contains SiC or silicon nitride (Si_3N_4). A suitable thickness for the silicon layer 14 is about 25 to about 250 micrometers (about 0.001 to

about 0.010 inch).

Please replace paragraph [0025] with the following amended paragraph:

[0025] In an investigation leading up to the present invention, the microstructure and mechanical integrity of coating systems of the type described above were found to vary considerably. According to the present invention, this variation in microstructure and mechanical integrity was determined to be dependent at least in part on the temperature of the substrate 10, hereinafter the deposition temperature, during the application of the YSZ topcoat 22. For the specimen shown in Figure 2, the YSZ topcoat 22 was deposited at a deposition temperature of about 550°C on a 50/50 vol.% YSZ/BSAS transition layer 20. The YSZ topcoat 22 is seen to be dense with vertical cracks that are desirable for improved strain tolerance. However, horizontal cracks ~~cracks 24~~ (cracks parallel to the surface of the substrate 10) can also be seen within the BSAS layer 18, the transition layer 20 and the YSZ topcoat 22 in the as-deposited condition. Also apparent in Figure 2, the microstructure of the coating system 12 can be seen to have a wrinkled appearance.

Please replace paragraph [0026] with the following amended paragraph:

[0026] Figure 3 represents an identical coating system after undergoing a high steam cycle furnace (HSCF) test to assess the durability and protective capability of the coating system. During the HSCF test, the specimen was exposed to 250 thermal cycles between room temperature and about 2400°F (about 1315°C) over a period of 500 hours in a flowing atmosphere of about 90% H_2O and about 10% O_2. In Figure 3, the damage to the microstructure of the coating system is apparent when compared with the microstructure shown in Figure 2. While not wishing to be held to any particular theory, the horizontal cracks ~~cracks 24~~ and wrinkled appearance seen in Figure 2 were believed to be the result of stresses due to thermal expansion mismatch between the layers 16, 18, 20 and 22 during deposition, and that the horizontal cracks ~~cracks 24~~ propagated during thermal cycling, causing the enlarged cracks and spallation seen in Figure 3. As such, the presence of the horizontal cracks ~~cracks 24~~ was concluded to be detrimental to the mechanical integrity of the coating system, and therefore the protection provided by the coating system.